

SHU 2044.1  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of Douglas F. Covey  
Serial No. 10/008,567  
Filed November 5, 2001  
Confirmation No. 6682  
For CYTOPROTECTIVE POLYCYCLIC COMPOUNDS

February 20, 2002

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS,  
SIR:

**INFORMATION DISCLOSURE STATEMENT**

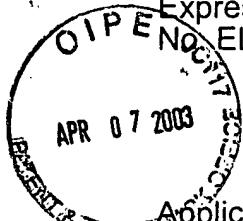
In accordance with 37 C.F.R. 1.97 and 1.98 and MPEP 609, and in compliance with the duty of disclosure set forth in 37 C.F.R. 1.56, applicant submits copies of references 1-25, 27-30, 32, 33, 35-38, 40-42 and 44-51 of the references listed on the attached PTO/SB/08A for consideration by the Patent and Trademark Office in the above-entitled application and to be made of record therein. Copies of references 26, 31, 34, 39, 43, 52 and 53 have been ordered but have not yet been received. We will supplement this Information Disclosure Statement with copies of these references as soon as they have been received.

Respectfully submitted,

Derick E. Allen, Reg. No. 43,468  
SENNIGER, POWERS, LEAVITT & ROEDEL  
One Metropolitan Square, 16th Floor  
St. Louis, Missouri 63102  
(314) 231-5400

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No. EL947978774US

SHU 2044.1  
PATENT

#9  
4/15/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of Douglas F. Covey  
Serial No. 10/008,567  
Filed November 5, 2001  
Confirmation No. 6682  
For CYTOPROTECTIVE POLYCYCLIC COMPOUNDS

Art Unit 1614

June 12, 2002

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS,  
SIR:

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

In accordance with 37 C.F.R. 1.97 and 1.98 and MPEP 609, and in compliance with the duty of disclosure set forth in 37 C.F.R. 1.56, Applicant submits copies of the references listed on the attached PTO/SB/08A for consideration by the Patent and Trademark Office in the above-entitled application and to be made of record therein. I certify that each item contained in this statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.

In addition, attached hereto as Exhibit A are copies of an Information Disclosure Statement, as well as a Supplement thereto, that were previously submitted to the Patent and Trademark Office on February 20, 2002 and March 26, 2002, respectively. These are being submitted herewith because, according to PAIR, they do not appear to have been entered at this time. If necessary, Applicant will again submit copies of the references cited therein.

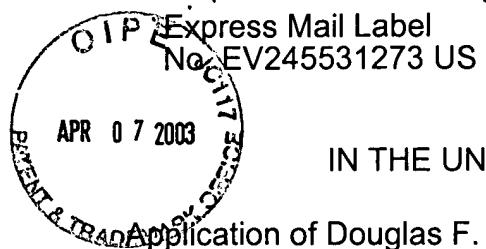
Respectfully submitted,

*Derick E. Allen*

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\*Enclosures



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For CYTOPROTECTIVE POLYCYCLIC COMPOUNDS  
Examiner Shaojia A. Jiang

Art Unit 1617

April 7, 2003

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS,  
SIR:

**SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

In accordance with 37 C.F.R. 1.97 and 1.98 and MPEP 609, and in compliance with the duty of disclosure set forth in 37 C.F.R. 1.56, Applicant submits copies of the references listed on the attached PTO/SB/08A for consideration by the Patent and Trademark Office in the above-entitled application and to be made of record therein. I certify that each item contained in this statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement. Enclosed is a copy of the Partial International Search Report for PCT/US01/47262, dated March 7, 2003 in which these references were cited.

\* \* \* \* \*  
In addition, attached hereto as Exhibit A are copies of Information Disclosure Statements filed on February 20, 2002, March 26, 2002 and June 12, 2002 previously submitted to the Patent and Trademark Office. These are being submitted herewith because, according to PAIR, they do not appear to have been entered at this time. If necessary, Applicant will again submit copies of the references cited therein.

Respectfully submitted,

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PTO/SB/08A APR 07 2003

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(use as many sheets as necessary)

Complete if Known

Application Number	10/008,567				
Filing Date	November 5, 2001				
Confirmation Number	6682				
First Named Inventor	Douglas F. Covey				
Group Art Unit	1614				
Examiner Name					
Sheet	1	of	5	Attorney Docket No.	WSHU 2044.1

## U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code <sup>2</sup> (if known)		
	1	3,472,885		Bucourt et al.	10-14-1969
	2	4,330,540		Zeelen	05-18-1982
	3	4,617,298		Bodor et al.	10-14-1986
	4	4,786,647		Simpkins et al.	11-22-1988
	5	5,554,601		Simpkins et al.	09-10-1996
	6	5,554,604		Bonfils et al.	10-10-1996
	7	5,679,668		Bonfils et al.	10-21-1997
	8	5,824,672		Simpkins et al.	10-20-1998
	9	5,843,934		Simpkins	12-01-1998
	10	5,859,001		Simpkins et al.	01-12-1999
	11	5,877,169		Simpkins	03-02-1999
	12	5,914,325		Droescher et al.	06-22-1999
	13	5,939,407		Landfield	08-17-1999
	14	5,972,923		Simpkins et al.	10-26-1999

Examiner Signature	Date Considered
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<sup>1</sup>Unique citation designation number. <sup>2</sup>See attached Kinds of U.S. Patent Documents. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, D.C. 20231.

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Sheet	2	of	5	Attorney Docket No.	WSHU 2044.1
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	15	6,197,833	B1	Simpkins et al.	03-06-2001
	16	6,207,658	B1	Simpkins et al.	03-27-2001
	17	6,265,147	B1	Mobley et al.	07-24-2001

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T <sup>6</sup>
		Office	Number <sup>4</sup>	Kind Code <sup>2</sup> (if known)			
18	CA	1 167 837			Akzo N.V.	05-22-1984	
19	EP	0 069 424	B1		Akzo N.V.	01-12-1983	
20	GB	1 298 587			American Home Products Corporation	12-06-1972	
21	WO	95/13076	A1		JENAPHARM GMBH	05-18-1995	
22	WO	97/03661	A1		University of Florida Research Foundation, Incorporated	02-06-1997	
23	WO	99/26630	A1		University of Florida Research Foundation, Incorporated	06-03-1999	
24	WO	00/63228	A1		Schering Aktiengesellschaft	10-26-2000	
25	WO	01/10430	A2		University of Florida Research Foundation, Inc.	02-15-2001	

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Sheet	3	of	5
		Attorney Docket No.	WSHU 2044.1

**OTHER ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>
	26	Akhter et al., Stroke, Vol. 25 (1994) p. 418.	
	27	A. ALLAIS et al. "3-( $\beta$ -Dialkylaminoethoxy)estra-1,3,5(10)-trienes" Chemical Abstracts, Vol. 70, No. 25; Abstract No. 115418e (1969) p. 381.	
	28	K. BARNIKOL-OETTLER et al. "Preparation of Estradiol 3-methyl Ether" Chemical Abstracts, Vol. 160, No. 25, Abstract No. 106:214199c (1987).	
	29	C. BEHL et al. "17- $\beta$ Estradiol Protects Neurons from Oxidative Stress-Induced Cell Death in vitro" Biochemical and Biophysical Research Communications, Vol. 216, No. 2 (1995) pp. 473-482.	
	30	G.C. BUZBY et al. "Totally Synthetic Steroid Hormones. XIII. The Chemical Resolution of Some Racemic Estrane, 13 $\beta$ -Ethylgonane, and 13 $\beta$ -n-Propylgonane Derivatives and the Preparation of Some Estrane and 13 $\beta$ -Ethylgonane Derivatives of Unnatural Configuration" Journal of Medicinal Chemistry, Vol. 10 (1967) pp. 199-204.	
	31	T. FAN et al. "ZYC-13, the enantiomer of 1,3,5(10)-estratriene 3-OL, exerts neuroprotective effects in vitro and in vivo" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.	
	32	Y. GOODMAN et al. "Estrogens Attenuate and Corticosterone Exacerbates Excitotoxicity, Oxidative Injury, and Amyloid $\beta$ -Peptide Toxicity in Hippocampal Neurons" Journal of Neurochemistry, Vol. 66, No. 5 (1996) pp. 1836-1844.	
	33	P. GREEN et al. " The Nonfeminizing Enantiomer of 17 $\beta$ -Estradiol Exerts Protective Effects in Neuronal Cultures and a Rat Model of Cerebral Ischemia" Endocrinology, Vol. 142, No. 1 (2001) pp. 400-406.	
	34	HALL et al., J. Cer. Blood Flow Metab., Vol. 11 (1991) p. 292.	

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35	H. KANEKO et al. "The Synthesis of 2- and 4-Alkoxymethylestrogenes" Chem. Pharm. Bull., Vol. 12, No. 2 (1964) pp. 196-203.
36	M. A. LEVITT et al. "Reduction of Infarct Size During Myocardial Ischemia and Reperfusion by Lazaroid U-74500A, a Nonglucocorticoid 21-Aminosteroid" J. of Cardiovascular Pharmacology, Vol. 23, No. 1 (1994) pp. 136-140.
37	W. LUNN et al. "The Adamantyl Carbonium Ion as a Dehydrogenating Agent, its Reactions with Estrone" Tetrahedron Letters, Vol. 24, No. 23 (1968) pp. 6773-6776.
38	C. MILLER et al. "In vitro antioxidant effects of estrogens with a hindered 3-OH function on the copper-induced oxidation of low density lipoprotein" Steroids, Vol. 61 (1996) pp. 305-308.
39	MOORADIAN, J. Steroid Biochem. Molec. Biol., Vol. 45 (1993) pp. 509-511.
40	M. NAKANO et al. "Novel and Potent Biological Antioxidants on Membrane Phospholipid Peroxidation: 2-Hydroxy Estrone and 2-Hydroxy Estradiol" Biochemical and Biophysical Research Communications, Vol. 142, No. 3 (1987) pp. 919-924.
41	E. NIKI et al. "Antioxidants in Relation to Lipid Peroxidation" Chemistry and Physics of Lipids, Vol. 44, Nos. 2-4 (1987) pp. 227-253.
42	T. PATTON et al. "Estrogens. IV. The Synthesis of 2- and 4-Alkylestrones" Journal of Organic Chemistry, Vol. 27, No. 3 (1962) pp. 910-914.
43	E. J. PERES et al. "762.7 - Structure-Activity Relationship of Estratrienes Against Glutamate Toxicity in a Mouse Hippocampal Cell Line" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.
44	L. PROKAI et al. "Synthesis and Biological Evaluation of 17 $\beta$ -Alkoxyestra-1,3,5(10)-trienes as Potential Neuroprotectants Against Oxidative Stress" J. Med. Chem., Vol. 44, No. 1 (2001) pp. 110-114.
45	W. ROMER et al. "Novel estrogens and their radical scavenging effects, iron-chelating, and total antioxidative actives: 17 $\alpha$ -substituted analogs of $\Delta^{9(11)}$ -dehydro-17 $\beta$ -estradiol" Steroids, Vol. 62 (1997) pp. 688-694.

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Group Art Unit	1614
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Sheet 5 of 5 Attorney Docket No. WSHU 2044.1

46	W. ROMER et al. "Novel "scavestrogens" and their radical scavenging effects, iron-chelating, and total antioxidative actives: $\Delta^{8,9}$ -dehydro derivatives of 17- $\alpha$ -estradiol and 17 $\beta$ -estradiol" Steroids, Vol. 62 (1997) pp. 304-310.
47	A.G. SCHERING, "Preparation of ent-steroids as Selectively Effective Estrogens" Chemical Abstracts, Vol. 133, No. 21, Abstract No. 133:296594x (2000) p. 766-767.
48	A. SEELIG et al. "A method to determine the ability of drugs to diffuse through the blood-brain barrier" Proc. Natl. Acad. Sci. USA, Vol. 91 (1994) pp. 68-72.
49	L. TIETZE et al. "Synthesis of new 16-spirosteroids" Steroids, Vol. 59 (1994) pp. 305-309.
50	J. WILSON et al. "U83836E Reduces Secondary Brain Injury in a Rabbit Model of Cryogenic Trauma" Journal of Trauma, Vol. 39, No. 3 (1995) pp. 473-479.
51	A. WUNDERLI et al. "Geometry of the Activated Complex of the Thermal and Charge-Induced Aromatic Para to Ortho Claisen Rearrangement" Helvetica Chimica Acta, Vol. 56 (1973) pp. 989-1011.
52	S. XIA et al. "A Novel Estrogen Analog, Inactive at the Estrogen Receptor, is Neuroprotective" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.
53	S-H. YANG et al. "Neuroprotective Effects of a Novel Non-Receptor Binding Estrogen Analogue During Stroke" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.

Examiner Signature	Date Considered
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	1	3,472,885	U	Bucourt et al.	10-14-1969
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	3	4,617,298	U	Bodor et al.	10-14-1986
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	5	5,554,601	V	Simpkins et al.	09-10-1996
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20	GB	1 298 587			American Home Products Corporation	12-06-1972	
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22	WO	97/03661	A1		University of Florida Research Foundation, Incorporated	02-06-1997	
23	WO	99/26630	A1		University of Florida Research Foundation, Incorporated	06-03-1999	
24	WO	00/63228	A1		Schering Aktiengesellschaft	10-26-2000	
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STATEMENT BY APPLICANT

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## Complete if Known

Application Number	10/008,567
Filing Date	November 5, 2001
Confirmation Number	6682
First Named Inventor	Douglas F. Covey
Group Art Unit	1614
Examiner Name	

Sheet 3 of 5 Attorney Docket No. WSHU 2044.1

## OTHER ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>
	26	Akhter et al., Safety Study of Tirlazad Mesylate in Patients With Acute Ischemic Stroke (STIPAS) Stroke, Vol. 25, No. 2 (1994) p. 418-423.	
	27	A. ALLAIS et al. "3-( $\beta$ -Dialkylaminoethoxy)estra-1,3,5(10)-trienes" Chemical Abstracts, Vol. 70, No. 25; Abstract No. 115418e (1969) p. 381.	
	28	K. BARNIKOL-OETTLER et al. "Preparation of Estradiol 3-methyl Ether" Chemical Abstracts, Vol. 160, No. 25, Abstract No. 106:214199c (1987).	
	29	C. BEHL et al. "17- $\beta$ Estradiol Protects Neurons from Oxidative Stress-Induced Cell Death in vitro" Biochemical and Biophysical Research Communications, Vol. 216, No. 2 (1995) pp. 473-482.	
	30	G.C. BUZBY et al. "Totally Synthetic Steroid Hormones. XIII. The Chemical Resolution of Some Racemic Estrane, 13 $\beta$ -Ethylgonane, and 13 $\beta$ -n-Propylgonane Derivatives and the Preparation of Some Estrane and 13 $\beta$ -Ethylgonane Derivatives of Unnatural Configuration" Journal of Medicinal Chemistry, Vol. 10 (1967) pp. 199-204.	
	31	T. FAN et al. "ZYC-13, the enantiomer of 1,3,5(10)-estratriene 3-OL, exerts neuroprotective effects in vitro and in vivo" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.	
	32	Y. GOODMAN et al. "Estrogens Attenuate and Corticosterone Exacerbates Excitotoxicity, Oxidative Injury, and Amyloid $\beta$ -Peptide Toxicity in Hippocampal Neurons" Journal of Neurochemistry, Vol. 66, No. 5 (1996) pp. 1836-1844.	
	33	P. GREEN et al. "The Nonfeminizing Enantiomer of 17 $\beta$ -Estradiol Exerts Protective Effects in Neuronal Cultures and a Rat Model of Cerebral Ischemia" Endocrinology, Vol. 142, No. 1 (2001) pp. 400-406.	
	34	HALL et al. "Sex Differences in Postischemic Neuronal Necrosis in Gerbils" J. Cer. Blood Flow Metab., Vol. 11 (1991) p. 292-298.	

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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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35	H. KANEKO et al. "The Synthesis of 2- and 4-Alkoxymethylestrogenes" Chem. Pharm. Bull., Vol. 12, No. 2 (1964) pp. 196-203.
36	M. A. LEVITT et al. "Reduction of Infarct Size During Myocardial Ischemia and Reperfusion by Lazaroid U-74500A, a Nonglucocorticoid 21-Aminosteroid" J. of Cardiovascular Pharmacology, Vol. 23, No. 1 (1994) pp. 136-140.
37	W. LUNN et al. "The Adamantyl Carbonium Ion as a Dehydrogenating Agent, its Reactions with Estrone" Tetrahedron Letters, Vol. 24, No. 23 (1968) pp. 6773-6776.
38	C. MILLER et al. "In vitro antioxidant effects of estrogens with a hindered 3-OH function on the copper-induced oxidation of low density lipoprotein" Steroids, Vol. 61 (1996) pp. 305-308.
39	MOORADIAN, Antioxidant Properties of Steroids" J. Steroid Biochem. Molec. Biol., Vol. 45 No. 6 (1993) pp. 509-511.
40	M. NAKANO et al. "Novel and Potent Biological Antioxidants on Membrane Phospholipid Peroxidation: 2-Hydroxy Estrone and 2-Hydroxy Estradiol" Biochemical and Biophysical Research Communications, Vol. 142, No. 3 (1987) pp. 919-924.
41	E. NIKI et al. "Antioxidants in Relation to Lipid Peroxidation" Chemistry and Physics of Lipids, Vol. 44, Nos. 2-4 (1987) pp. 227-253.
42	T. PATTON et al. "Estrogens. IV. The Synthesis of 2- and 4-Alkylestrones" Journal of Organic Chemistry, Vol. 27, No. 3 (1962) pp. 910-914.
43	E. J. PEREZ et al. "762.7 - Structure-Activity Relationship of Estratrienes Against Glutamate Toxicity in a Mouse Hippocampal Cell Line" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.
44	L. PROKAI et al. "Synthesis and Biological Evaluation of 17 $\beta$ -Alkoxyestra-1,3,5(10)-trienes as Potential Neuroprotectants Against Oxidative Stress" J. Med. Chem., Vol. 44, No. 1 (2001) pp. 110-114.
45	W. ROMER et al. "Novel estrogens and their radical scavenging effects, iron-chelating, and total antioxidative actives: 17 $\alpha$ -substituted analogs of $\Delta^{9(11)}$ -dehydro-17 $\beta$ -estradiol" Steroids, Vol. 62 (1997) pp. 688-694.

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	46	W. ROMER et al. "Novel "scavestrogens" and their radical scavenging effects, iron-chelating, and total antioxidative actives: $\Delta^{8,9}$ -dehydro derivatives of 17- $\alpha$ -estradiol and 17 $\beta$ -estradiol" Steroids, Vol. 62 (1997) pp. 304-310.	
	47	A.G. SCHERING, "Preparation of ent-steroids as Selectively Effective Estrogens" Chemical Abstracts, Vol. 133, No. 21, Abstract No. 133:296594x (2000)-p. 766-767.	
	48	A. SEELIG et al. "A method to determine the ability of drugs to diffuse through the blood-brain barrier" Proc. Natl. Acad. Sci. USA, Vol. 91 (1994) pp. 68-72.	
	49	L. TIETZE et al. "Synthesis of new 16-spirosteroids" Steroids, Vol. 59 (1994) pp. 305-309.	
	50	J. WILSON et al. "U83836E Reduces Secondary Brain Injury in a Rabbit Model of Cryogenic Trauma" Journal of Trauma, Vol. 39, No. 3 (1995) pp. 473-479.	
	51	A. WUNDERLI et al. "Geometry of the Activated Complex of the Thermal and Charge-Induced Aromatic Para to Ortho Claisen Rearrangement" Helvetica Chimica Acta, Vol. 56 (1973) pp. 989-1011.	
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	53	S-H. YANG et al. "Neuroprotective Effects of a Novel Non-Receptor Binding Estrogen Analogue During Stroke" Presented at the 26th Soc. for Neuroscience Meeting, 11/4/00 to 11/9/00.	

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